first, being considered sheet lightning, were only noticed from their unusual colour, a deep and sombre red. At about $4^h 50^m$ A.M., however, these flashes constantly emerging from a dense, triangular and very remarkable cloud in the S.E., which perceptibly increased in size with great rapidity, he was induced to observe it with minute attention. At $4^h 55^m$ A.M., Greenwich mean time, the cloud had assumed the form of a right-angled triangle, its hypothenuse, or longest side, tending east and west. At this instant he first heard a singular and extraordinary hissing sound in the air, not unlike that of a passing shot, which, although at first not very loud, was yet clearly distinguishable above the howling of the gale. At 5 A.M. the cloud had nearly doubled its original size, advancing steadily from the S.E. in a N.W. direction, or from nearly dead to leeward, towards the wind's eye; whilst the scintillations spoken of were emitted with increased rapidity. He also then first perceived in the centre of the cloud, a dull, red, obscure nucleus, or fire-ball, apparently about half the diameter of the moon, having a tail five or six times that length, from which the flashes mentioned were sent forth, of surpassing brilliancy, as the meteor clearly descended with great velocity through the air, accompanied by a detonating, hurtling, hissing sound, impossible to describe, yet resembling that which precedes the shock of an earthquake. At three minutes past five o'clock A.M., the meteor having apparently spanned the Channel from S.E. to N.W., upon approaching the land—evidently throwing off portions of its substance as it passed through the atmosphere—the nucleus suddenly exploded with a report similar to a very heavy clap of thunder, giving out an intensely brilliant light, which rendered the minutest objects distinctly visible, although it rained violently and the sky was obscured by dark and threatening clouds. The dense body of the meteorite seemed to fall in the water about half a mile from the land, as indicated by a great volume of spray, which rose foaming in the distance.

February 3, 1853.

COLONEL SABINE, R.A., Treasurer, V.P., in the Chair.

The following letters were read:—

MONSIEUR LE COMTE, À Berlin, ce 30 Dec. 1852.

C'est avec la plus vive reconnaissance, je pourrais dire, avec le genre d'émotion que l'on éprouve lorsqu'on obtient un succès auquel on n'a pas cru devoir aspirer, que j'ai reçu la médaille Copley, le grand et noble prix que la Société Royale, sous le Présidence de Monsieur le Comte de Rosse, a daigné m'adjuger. Cette illustre Compagnie a voulu recompenser un zèle ardent pour les sciences, des travaux peu remarquables par leurs resultats, mais fortifiés, dans le cours d'une longue et laborieuse carrière, par la constance d'une courageuse assiduité. En vous suppliant, Monsieur le Comte, de

kept for ever in their apartments in Somerset House. And I hereby declare that my will and intention as to the arrangement of the memoirs, engravings, drawings, autographs, books, the gold watch formerly belonging to Sir Isaac Newton, the gems and other relics of which the said 'Collectanea' is composed, is expressed in a manuscript catalogue, which will be found in the box containing the collection, and signed by me. But it is not my intention that the plan therein described should be strictly adhered to, if the President and Council prefer any other method with regard to the arrangement of the work.

"And I hereby direct my executors to pay the above legacy within three months after my decease; and if two hundred pounds should not be sufficient for the purposes before mentioned, then my executors are hereby required and empowered to advance fifty pounds more (free of legacy duty); and if there should be any overplus in either case, then the President and Council of the said Society are at liberty to apply such overplus in the purchase of books for the Library, or in any other way for the benefit of the Royal Society."

The reading of Mr. Airy's paper, entitled "On the Eclipses of Agathocles, Thales and Xerxes," was resumed and concluded.

The author, after remarking that the calculations of distant eclipses made in the last century possess little value, proceeds to give the successive steps of improvement in the lunar theory as applicable to the computation of eclipses, and especially in the motion of the moon's node. The first great improvement was the introduction by Laplace of terms expressing a progressive change in the mean secular motions. With Bürg's tables, in which these changes were introduced, or with the same elements, Mr. Francis Baily and Mr. Ottmanns computed many eclipses in the search for that usually called the eclipse of Thales; and both these astronomers fixed upon the eclipse of B.C. 610, September 30, as the only one which could be reconciled with the account of Herodotus. Mr. Baily however subjoined a computation of the eclipse of Agathocles from the same elements, and found that this could not by any means be reconciled with the historical account; he inferred from this that some serious change in the theory is necessary, and that when it was introduced the eclipse of B.C. 610 might not be found to agree with history; but he thought it certain that no other eclipse could be adopted. The various values of the motion of the node adopted by different writers from different observations (principally total or annular eclipses) are then collected. Allusion is then made to the peculiar value of the eclipse of Stiklastad (brought to notice by Professor Hansteen), and which will be increased when the calculations shall have been made on unexceptional elements. The author then adverts to the great Reduction of the Greenwich Observations from 1750 to 1830, to Hansen's new inequalities, and to the numerical amounts of corrections of the principal elements. Then are given the coefficients of the change in secular value of mean motion of the mean of the moon's perigee, and of the moon's node, as found by

Laplace, Damoiseau, Plana, and Hansen; the principal change made by the latter writers from Laplace's values being in the motion of perigee.

The method of computation adopted by the author is then explained. He adopts the Greenwich mean motions and Damoiseau's coefficients for progressive change of secular mean motion. He then repeats the calculation with an arbitrary change of longitude of node; considering that, from the loose nature of the early Greenwich observations, this element is most likely to be in error, and that its errors will produce the greatest effect.

The author then discusses the account of the eclipse of Agathocles, B.C. 310, August 15. Adopting Alhowareah (under Cape Bon) as his landing-place in Africa, he states his belief that Agathocles sailed northward from Syracuse (a conjecture which he owes in the first instance to J. W. Bosanquet, Esq.), and was not far from the Straits of Messina. On the usual supposition of his sailing to the south, he would be near Cape Passaro.

On making the calculation with the Greenwich Elements unvaried, it is found that the eclipse would be total on the southern possible place of Agathocles, but not on the northern. The calculation being repeated with an arbitrary change in the place of the node, a graphical construction is employed to discover the numerical amount of the changes that must be made to satisfy the four following conditions:—1, the northern edge of the shadow touches the south station; 2, the northern edge touches the north station; 3, the southern edge touches the south station; 4, the southern edge touches the north station. If the south station be adopted, the change must lie between those of conditions 1 and 3; if the north, the change must lie between those of 2 and 4. The numerical values must be slightly increased for application to a more distant eclipse, as to that of Thales.

The eclipse of Thales is then considered. There appears to be no reason for connecting the locality (as Mr. Baily supposed) with the river Halys. The historical circumstances indicate with great probability that two large armies had met; and the question appears to be, in what part of Asia Minor is it likely that such bodies of troops would be collected. The author adverts to the form and passes of the mountains, and decides that the Median army entered most probably by the pass of Issus, or possibly by that of Melitene, and that the battle-field might be anywhere in the space bounded by Melitene, Issus, Iconium, Sardes, and Ancyra.

On calculating the eclipses which occurred for many years before and after B.C. 600, it appears that only the eclipse of B.C. 585, May 28, answers to the requisite conditions, and that it does so in a most satisfactory way. [This is the date adopted by the principal ancient chronologists; it would seem that it was first verified, by calculations founded on good elements, by J. R. Hind, Esq. during the preparation of this paper.] The path of the shadow which is most agreeable to the military and geographical circumstances, is one which implies a correction to the Greenwich Elements corresponding to that which would make the eclipse of Agathocles nearly central over the northern station, and excludes the possibility of his passing by the southern route.

The author then adverts to the principal remaining causes of uncertainty in these conclusions, and points out the values of progressive change in the secular mean motions as peculiarly deserving investigation.

Allusion is then made to a record in the Persian poetical history, preserved by Sir John Malcolm, which appears to point to a total eclipse as occurring under similar circumstances in the province of Mazenderan. It appears however on calculation, that no total eclipse passed over Mazenderan, at least for many years, about the time in question.

The author then calls attention to the statement of Herodotus, that something like a total solar eclipse occurred when Xerxes was setting out from Sardes for his invasion of Greece. On calculation it appears impossible to explain this by a solar eclipse, and moreover the peculiar turn of the answer of the Magi to the inquiries of Xerxes would seem to be irreconcileable with a solar eclipse. The author thinks it most likely that the phenomenon really was the total eclipse of the moon which occurred on the morning of B.C. 479, March 14. If this were adopted, the date of the invasion of Greece must be brought down one year later than that given by the received chronology.

February 10, 1853.

LORD WROTTESLEY, V.P., in the Chair.

The following papers were read:—

1. "On the determination of the Mean Temperature of every day in the year, as deduced from the Observations taken at the Royal Observatory, Greenwich, in the Years from 1814 to 1851." By James Glaisher, Esq., F.R.S. Received Dec. 30, 1852.

This paper has for its object the determination of the true distribution of heat over the year, and is based upon an extensive series of observations taken at the Royal Observatory during thirty-eight years.

In order to obtain a correct determination of the mean daily temperature of each month, necessary to the proposed object, the author at the commencement of his memoir explains how the entire series of observations has been divided into groups, according to the recorded times of observation, for the purpose of applying the necessary corrections calculated from his tables of Diurnal Range, published in the Phil. Trans. for 1848. Having carefully explained his method of arranging and testing his data, and providing for exceptional days, upon which but few observations were recorded, the author gives the results in twelve separate tables, which exhibit the mean daily temperatures of every month in each of the thirty-eight years. In a